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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample and a personnel evaluation form are also included. (AG)

B-641
S-361

United States Employment Service Technical Report

March 1966

ED 072061

Development of USES Aptitude Test Battery

for

Garment Packer

(any ind.) 920.887

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U.S. DEPARTMENT OF LABOR
W. Willard Wirtz, Secretary
MANPOWER ADMINISTRATION
BUREAU OF EMPLOYMENT SECURITY
Washington, D.C. 20210

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Technical Report on Development of USES Aptitude Test Battery

For .....

Garment Packer (any ind.) 9-68.30
(920.887)

B-641 or S-361

U. S. Employment Service
in Cooperation with
California and Tennessee State Employment Services

March 1966

GATB Study #2589

DEVELOPMENT OF USES APTITUDE TEST BATTERY

For

Garment Packer (any ind.) 9-68.30
(920.887)

This report describes research undertaken for the purpose of determining General Aptitude Test Battery (GATB) norms for the occupation of Garment Packer (any ind.) 9-68.30. The following norms were established:

GATB Aptitudes	Minimum Acceptable GATB, B-1002 Scores
G - General Learning Ability	80
V - Verbal Aptitude	85
N - Numerical Aptitude	85
Q - Clerical Perception	80

RESEARCH SUMMARY

Sample:
51 male workers employed as Garment Packers in San Jose, California and Knoxville, Tennessee.

Criterion:
Supervisory ratings

Design:
Concurrent (test and criterion data were collected at approximately the same time).

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, standard deviations, aptitude-criterion correlations and selective efficiencies.

Concurrent Validity:
Phi Coefficient = .47 ($P/2 < .0005$)

Effectiveness of Norms:
Only 65% of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 83% would have been good workers. 35% of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 17% would have been poor workers. The effectiveness of the norms is shown graphically in Table 1.

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Workers	65%	83%
Poor Workers	35%	17%

SAMPLE DESCRIPTION

Size:
N = 51

Occupational Status:
Employed workers

Work Setting:
Workers were employed at Levi Strauss and Company plants in San Jose, California and Knoxville, Tennessee.

Employer Selection Requirements:

Education:
San Jose plant - none
Knoxville plant - prefers high school graduates.

Previous Experience:
San Jose plant - none
Knoxville plant - prefers some packing experience.

Tests:
None at either plant

Other:
San Jose plant - none
Knoxville plant - personal interview

Principal Activities:

The job duties for each worker in the final sample are comparable to those in the job description in the Appendix.

Minimum Experience:

All workers in the sample had completed one month on-the-job training, which was considered the minimum training to attain job proficiency.

TABLE 2

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education and Experience

	Mean	SD	Range	r
Age (years)	30.9	10.4	20-69	-.235
Education (year)	11.1	1.6	6-15	-.036
Experience (months)	48.2	49.5	2-216	-.154

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002B were administered between March 1, 1965 and July 15, 1965, concurrent with the collection of criterion data.

CRITERION

The criterion data consisted of supervisory ratings of job proficiency made at approximately the same time as test data were collected. Ratings and reratings, obtained at least two weeks later, were made by the immediate supervisor of each worker.

Rating Scale:

An adaptation of USES Form SP-21, "Descriptive Rating Scale" (see Appendix). The scale consisted of six items covering different aspects of job performance. Each item had five alternatives corresponding to different degrees of job proficiency.

Reliability:

A reliability coefficient of .88 was obtained between the initial ratings and reratings, indicating a significant relationship. The final criterion score consisted of the combined score of the two ratings.

Criterion Score Distribution:

Possible Range:	12-60
Actual Range:	36-60
Mean:	49.0
Standard Deviation:	6.1

Criterion Dichotomy:

The criterion distribution was dichotomized into low and high groups by placing 35% of the sample in the low group to correspond with the percentage of workers considered unsatisfactory or marginal by the supervisors. Workers in the high criterion group were designated as "good workers" and those in the low group as "poor workers". The criterion critical score was 48.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were selected for tryout in the norms on the basis of a qualitative analysis of job duties involved and a statistical analysis of test and criterion data. Aptitude K which does not have a high correlation with the criterion was considered for inclusion in the norms because the qualitative analysis indicated that it was important for the job duties and the sample had a relatively high mean score for this aptitude. Tables 3, 4, and 5 show the results of the qualitative and statistical analysis.

TABLE 3

Qualitative Analysis
(Based on the job analysis, the aptitudes indicated appear to be important to the work performed)

Aptitude	Rationale
G - General Learning Ability	Important to learn and understand packing procedures and principles and put them into effect.
Q - Clerical Perception	Important to scan order form quickly for completeness, transfer correct numbers and shipping information from label to boxes and compare data on labels.
K - Motor Coordination	Important to quickly and precisely assemble boxes, pack boxes properly and seal boxes, making precise movements and coordinating eye and hand movements.

TABLE 4

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlation with the Criterion (r) for the Aptitudes of the GATB

	Mean	SD	Range	r
G - General Learning Ability	95.8	14.6	60-137	.295*
V - Verbal Aptitude	91.7	13.0	68-123	.329*
N - Numerical Aptitude	93.5	19.5	48-144	.296*
S - Spatial Aptitude	106.2	17.4	65-140	.021
P - Form Perception	107.1	18.1	68-153	.302*
Q - Clerical Perception	104.1	14.6	69-146	.328*
K - Motor Coordination	107.1	16.4	82-159	.261
F - Finger Dexterity	96.3	20.0	64-139	.183
M - Manual Dexterity	103.3	18.3	66-152	.035

* Significant at the .05 level

TABLE 5

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important	X					X	X		
Irrelevant									
Relatively High Mean				X	X		X		
Relatively Low Standard Dev.	X	X				X			
Significant Correlation with Criterion	X	X	X		X	X			
Aptitudes to be Considered for Trial Norms	G	V	N		P	Q	K		

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of a comparison of the degree to which trial norms consisting of various combinations of aptitudes G, V, N, P, Q and K at trial cutting scores were able to differentiate between the 65% of the sample considered "good workers" and the 35% of the sample considered "poor workers." Trial cutting scores at five point intervals approximately one standard deviation below the mean are tried because this will eliminate about one third of the sample with three-aptitude norms. For two-aptitude trial norms, minimum cutting scores of slightly more than one standard deviation below the mean will eliminate about one third of the sample. And for four-aptitude trial norms, cutting score of slightly less than one standard deviation below the mean will eliminate about one third of the sample. The Phi Coefficient was used as a basis for comparing trial norms. Norms of G-80, V-85, N-85 and Q-80 provided the highest degree of differentiation. The validity of these norms is shown in Table 6 and is indicated by a Phi Coefficient of .47 (statistically significant at the .0005 level).

TABLE 6

Concurrent Validity of Test Norms, G-80, V-85, N-85 and Q-80

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	8	25	33
Poor Workers	13	5	18
Total	21	30	51

Phi Coefficient (ϕ) = .47 Chi Square (X^2) = 11.07
Significance Level = $P/2 < .0005$

DETERMINATION OF OCCUPATIONAL APTITUDE PATTERN

The data for this study met the requirements for incorporating the occupation studied into OAP-19 which is shown in Section II of the Guide to the Use of the General Aptitude Test Battery. A Phi Coefficient of .27 is obtained with the OAP-19 norms of G-80, N-80, Q-80.

SP-21
Rev. 2/61

A-P-P-E-N-D-I-X

DESCRIPTIVE RATING SCALE
(For Aptitude Test Development Studies)

Score____

RATING SCALE FOR GARMENT PACKER (any ind.) 9-68.30
D. O. T. Title and Code

Directions: Please read Form SP-20, "Suggestions to Raters", and then fill in the items listed below. In making your ratings, only one box should be checked for each question.

Name of Worker (print) _____
(Last) (First)

Sex: Male_____ Female_____

Company Job Title: _____

How often do you see this worker in a work situation?

☐ See him at work all the time.

☐ See him at work several times a day.

☐ See him at work several times a week.

☐ Seldom see him in work situation.

How long have you worked with him?

☐ Under one month.

☐ One to two months.

☐ Three to five months.

☐ Six months or more.

A. How much work can he get done? (Worker's ability to make efficient use of his time and to work at high speed.)

☐ 1. Capable of very low work output. Can perform only at an unsatisfactory pace.

☐ 2. Capable of low work output. Can perform at a slow pace.

☐ 3. Capable of fair work output. Can perform at an acceptable but not a fast pace.

☐ 4. Capable of high work output. Can perform at a fast pace.

☐ 5. Capable of very high work output. Can perform at an unusually fast pace.

B. How good is the quality of his work? (Worker's ability to do high-grade work which meets quality standards.)

☐ 1. Performance is inferior and almost never meets minimum quality standards.

☐ 2. The grade of his work could stand improvement. Performance is usually acceptable but somewhat inferior in quality.

☐ 3. Performance is acceptable but usually not superior in quality.

☐ 4. Performance is usually superior in quality.

☐ 5. Performance is almost always of the highest quality.

C. How accurate is he in his work? (Worker's ability to avoid making mistakes.)

☐ 1. Makes very many mistakes. Work needs constant checking.

☐ 2. Makes frequent mistakes. Work needs more checking than is desirable.

☐ 3. Makes mistakes occasionally. Work needs only normal checking.

☐ 4. Makes few mistakes. Work seldom needs checking.

☐ 5. Rarely makes a mistake. Work almost never needs checking.

D. How much does he know about his job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with his work.)

☐ 1. Has very limited knowledge. Does not know enough to do his job adequately.

☐ 2. Has little knowledge. Knows enough to "get by."

☐ 3. Has moderate amount of knowledge. Knows enough to do fair work.

☐ 4. Has broad knowledge. Knows enough to do good work.

☐ 5. Has complete knowledge. Knows his job thoroughly.

E. How much aptitude or facility does he have for this kind of work? (Worker's adeptness or knack for performing his job easily and well.)

☐ 1. Has great difficulty doing his job. Not at all suited to this kind of work.

☐ 2. Usually has some difficulty doing his job. Not too well suited to this kind of work.

☐ 3. Does his job without too much difficulty. Fairly well suited to this kind of work.

☐ 4. Usually does his job without difficulty. Well suited to this kind of work.

☐ 5. Does his job with great ease. Exceptionally well suited for this kind of work.

F. How large a variety of job duties can he perform efficiently? (Worker's ability to handle several different operations in his work.)

☐ 1. Cannot perform different operations adequately.

☐ 2. Can perform a limited number of different operations efficiently.

☐ 3. Can perform several different operations with reasonable efficiency.

☐ 4. Can perform many different operations efficiently.

☐ 5. Can perform an unusually large variety of different operations efficiently.

S-361 March 1966

FACT SHEET

Job Title:

Garment Packer (any ind.) 9-68.30 (920.887)

Job Summary: Packs finished cotton trousers and jackets in cardboard cartons for shipping: Assembles carton; places folded garments in carton and places sheet of lining paper between layers to prevent chaffing and transfer of dyes; closes carton by stapling; and affixes shipping label to carton.

Work Performed:

Packs finished cotton trousers and jackets in cardboard cartons for shipping.

Prepares to pack: Pushes or pulls packing platform with work stand to position at right angles to order to be packed. Picks up order form from top of garments assembled for packing by checker on layout table and places form on work stand. Scans order form to insure checker has checked each unit. Returns order form to checker to complete when checking omissions occurs. Estimates number and size of cartons to be used by observing size of stacks of garments and reading number of units from order form. Walks to adjacent piles of sized, folded and unassembled cartons. Notifies packing supervisor when a pile is depleted or insufficient. Picks up number and size required and carries to work station. Leans folded cardboard against layout table. Expands folded cardboard to form open ended container. Folds pre-creased end and side extension flaps inward to form bottom of carton. Pushes button on tape shooter on work stand to obtain desired length of moistened

gummed paper tape. Seals bottom by pressing moist tape along center joint of folded side extension flaps. Obtains and presses one or more short strips of tape perpendicular to first seal and across middle of sealed bottom for added strength. Places carton on rollers of packing platform with open end up. Picks up sheet of lining paper from shelf of work stand and places in bottom of carton for dust protection.

Packs garments: Lifts two to three folded garments simultaneously from stack on layout table and places in carton. Repeats, alternating folded edges of garments to fill evenly and flatly. Places sheet of lining paper between layers of garments of different colors and materials to prevent chaffing and transfer of dyes by rubbing. Overfills carton four to four and one-half inches.
Snaps out perforated pack slip copy of order form and places on top of garments in last carton of order. Places sheet of lining paper on last layer of garments. Compresses garments with hand or forearm. Folds pre-creased end and side extension flaps inward to form top of carton. Staples overlapping side flaps together at the ends using heavy duty stapler to close carton. Occasionally closes small carton with crossed strips of gummed taped. Occasionally cuts down edges of carton with straight edge knife for orders not filling a carton, and seals with tape.

Prepares carton(s) for strapper: Stamps consecutive carton number(s) on back of order form with hand numbering machine. Prints same number on top of carton with felt tip marking pen. Prints initials or abbreviated name of transportation carrier on top of carton(s) as indicated on order form. Obtains name of carrier,

when omitted from order, from packing supervisor or in his absence from shipping clerk. Removes prepared gummed shipping label(s) from order form. Compares addresses on label with that on order form. Places incorrect labels in waste carton on work stand. Asks checker for correct label(s) from alphabetical file of extra addressed labels of repeat customers. Goes to packing department office, gets blank label(s) and types correct shipping label when checker does not have extra supply. Asks typist in packing office to prepare label(s) during peak packing season. Draws gummed side of label over wet brush of label moistener on work stand and presses on top of carton. Places unused extra labels in box on work stand to give to checker for file. Reads carton number(s) stamped on back of order form and compares with number(s) printed on carton(s) to insure completeness. Pushes packed carton(s) along rollers of packing platform onto rollers of power conveyor platform leading toward strapper. Signs last name or initials under stamped consecutive carton number(s) on back or order form to identify the packer and places it on top of last carton in line on conveyor platform.

Packs and marks export and special orders in accordance with specific instructions of packing supervisor.

Maintains equipment; obtains and replenishes supplies from stock room; keeps work stand neat and orderly; and empties waste carton into central waste box for disposition by janitor.

(This sheet is printed in duplicate. One copy should remain as part of the Appendix in order to complete the technical report. The other copy can be removed by employment service personnel who wish to set up separate fact sheet files.)

GPO 906-208

S-361 March 1966

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